



**PRELIMINARY PHYTOCHEMICAL SCREENING OF GRAPE SEED
(VITIS.VINIFERA) EXTRACTION**

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ABSTRACT

Grape seed extract (GSE) is a dietary supplement made by removing, drying, and pulverizing the bitter-tasting seeds of grapes. Grape seeds are rich in antioxidants, including phenolic acids, anthocyanins, flavonoids, and oligomeric proanthocyanin complexes (OPCs). Today, standardized extracts of grape seed may be used to treat a range of health problems related to free radical damage, including heart disease, diabetes, and cancer. Grape seed extract has also been shown to protect against bacterial infections, such as *Staphylococcus aureus*. **Objective:** The present study aims to evaluate the qualitative phytochemical analysis for aqueous water, ethanol, and methanol extraction. **Methodology:** The current work entails extracting grape seeds from the *Vitis vinifera* family and performing a preliminary phytochemical analysis on them. a qualitative phytochemical examination of the compound's anthocyanin, alkaloid, flavonoids, tannin, phenol, glycosides, terpenoids, and saponin and quantitative analysis of crude fibre, fat protein and sterols. **Results:** The current study aims to evaluate the qualitative phytochemical analysis for aqueous water, ethanol, and methanol extractions. Preliminary qualitative phytochemical analysis of the aqueous water, ethanal, and methanolic extracts of grape seed showed the presence of alkaloids, flavonoids, lignin, phenol, tannin, crude fibre, fat, protein, sterols, and total carbohydrates. whereas quinones, saponins, and terpenoids are absent. In quantitative analysis of phytochemicals present in various grape seed extracts, ethanal and methanolic extracts are absorbed in the crude fibre (39.7g), protein (7.4 g), sterols (7.6 g), and total carbohydrates (70.5 g) that are present. **Conclusion:** Because grape seeds include tannins, phenols, and flavonoids, they can be a powerful bioactive agent. It is a good source of phytochemicals, antioxidants, and can be used to treat infections.

Key words: Grape seed, Vits vinifera, Aqueous water, Ethanol extract, Methanol extract, Phytochemicals.



1. INTRODUCTION

A grape is a fruit, botanically a berry, of the deciduous woody vines of the flowering plant genus *Vitis Vinifera*. Grapes are a non-climacteric type of fruit, generally occurring in clusters. The cultivation of grapes began perhaps 8,000 years ago, and the fruit has been used as human food over history. Eaten fresh or in dried form (as raisins, currants and sultanas), grapes also hold cultural significance in many parts of the world, particularly for their role in winemaking. Other grape-derived products include various types of jam, juice, vinegar and oil.

Grape seeds are small, crunchy, pear-shaped seeds found in the middle of seeded grapes. Grapes may have one or several seeds inside. Some people find that grape seeds have a bitter flavor. While they may not be the tastiest, they're harmless for most people to eat. Grapes are a type of fruit that grow in clusters of 15 to 300, and can be crimson, black, dark blue, yellow, green, orange, and pink. "White" grapes are actually green in color, and are evolutionarily derived from the purple grape. Mutations in two regulatory genes of white grapes turn off production of anthocyanins, which are responsible for the color of purple grapes. Anthocyanins and other pigment chemicals of the larger family of polyphenols in purple grapes are responsible for the varying shades of purple in red wines.

Grapes are typically an ellipsoid shape resembling a prolate spheroid. grape seeds contain about twice the total polyphenol content of skins. Grape seed oil from crushed seeds is used in cosmeceuticals and skincare products. Grape seed oil, including tocopherols (vitamin E) and high contents of phytosterols and polyunsaturated fatty acids such as linoleic acid, oleic acid, and alpha-linolenic acid.

2. MATERIALS AND METHODS

The grape (*Vitis Vinifera*) was purchased in local market. Seeds were separated from grape fruits and dried in shadow. The dried seeds were ground to powder using electric blender and later I sieved that powder and then I used for that aqueous, methanol and ethanol extraction.

Preparation of extraction:

20g of grape seed powder was dissolved in 400ml of grape seed powder was dissolved in 400ml of aqueous water, ethanol & methanol and overnight at 120 rpm. Then the mixture was filtered using whatmann No.40 filter paper and the filtrate was evaporated at room temperature to get dried powder. The yield extract was calculated using the formula.

Yield of dried extract was calculated using the formula

$$\text{Yield (\%)} = \frac{w_1 \times 100}{w_2}$$



Where, W1 was the weight of extract after evaporation and W2 was the dry weight of the sample.



Methanol Extraction



Grape seed Powder



Ethanol Extraction



Grape seed extraction-After evaporation

Preliminary phytochemical screening

Phytochemical examination was carried out for the aqueous water, ethanol and methanol as per the standard methods.

Detection of Carbohydrates



Fehling's test:

Take 5ml of seed extract was hydrolyzed with distilled HCL, neutralized with alkali and heated Fehling's A and B solutions. Formation of red precipitate indicates the presence of reducing sugar.

Detection of proteins

Take 5ml of crude extract was treated with few drops of conc. Nitric acid. Formation of purple color suggesting the presence of free amino acids.

Benedicts test:

Take 5ml of seed extract was hydrolyzed with few drops of Benedicts' reagent (alkaline solution containing cupric citrate complex) and boiled in water bath, observed for the formation of reddish-brown precipitate to show a positive result for the presence of carbohydrates.

Alkaloids

Take 5ml of seed extract and add Mayers Reagent (Dissolving a mixture of mercuric chloride (1.36 g) and of potassium iodide (5.00 g) in 100.0 ml distilled water). The Appearance of Cream colored precipitate indicates the presence of alkaloids.

Flavonoids

Take an aliquot of the seed extract (2-3ml) and few drops of sodium hydroxide solution were added into a test tube. Formation of intense yellow color that became colorless on addition of few drops of dilute HCl indicates the presence of flavonoids.

Phenol

Take 5ml of seed extract with 5ml FeCl₃ solution was added. The formation of an intense color indicates the presence of phenols.

Steroids

Take 2ml of seed extract and dissolve in 10ml of chloroform. Equal volume of Con.H₂SO₄ was added by sides of the test tube. The upper layer turns red and sulphuric acid layer showed yellow with green fluorescence. This indicated the presence of steroids.

Terpenoids



Take 5ml of seed extract and added to 5ml of acetic anhydride and addition of con.H₂SO₄. The formations of blue green ring indicate the presence of terpenoids.

Tannin

Take 5ml of seed extract and added to few drops of 1% lead acetate. The yellowish precipitate indicated the presence of tannins.

Saponin

Take 5ml of seed extract and mixed with 20ml of distilled water. Agitated in a graduated cylinder for 15 minutes. Formation of foam indicates the presence of Saponins.

3. RESULTS AND DISCUSSION

Grape seeds contain significant levels of proanthocyanins, which have caught consumers' interest due to their possible health benefits. Proanthocyanins have been demonstrated to have potent antioxidant properties in vitro, to scavenge reactive oxygen and nitrogen species, to regulate immunological response and platelet activation, and to result in vasorelaxation by causing the release of nitric oxide (NO) from endothelium. Proanthocyanins also slow the development of atherosclerosis and stop the concentration of low-density lipoprotein (LDL).

Phytochemical screening:

Phytochemical screening of grape seed and skin revealed the presence of flavonoids, carbohydrates, tannins, flavonoids, terpenoids, proteins, anthraquinones, and phenols. Cardiovascular glycosides, saponins, aminoacids, and steroids were not present.

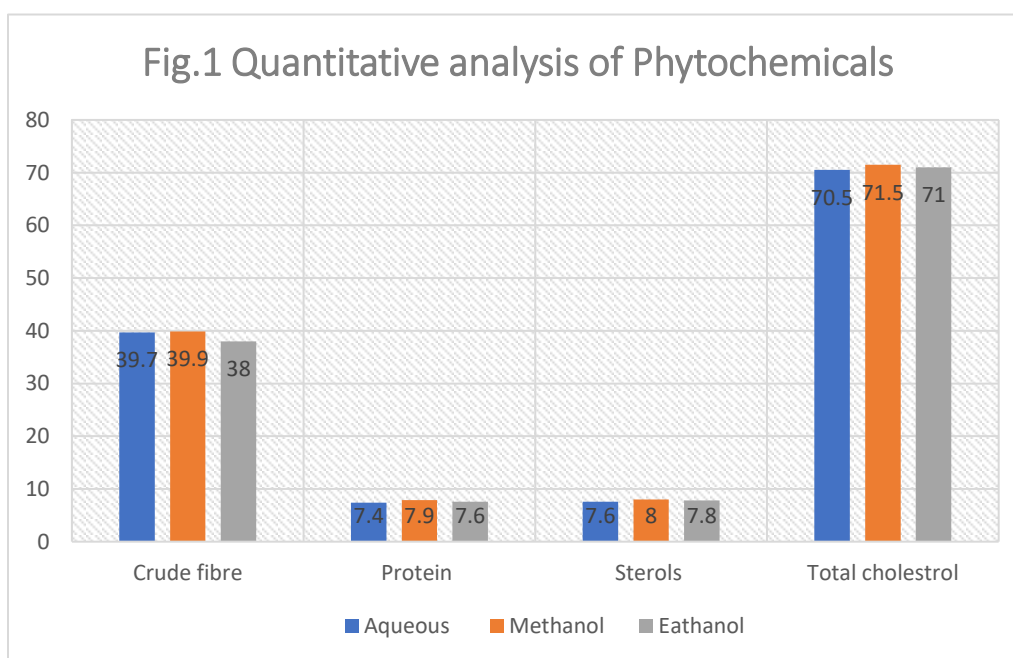
Table 1. Phytochemical screening of Grape seed extract

Phytochemical Test	Aqueous	Methanol	Ethanol
Alkaloids	+	+	+
Flavonoids	+	+	+
lignin	+	+	+
Phenol	+	+	+
Quinones	-	-	-
Saponin	-	-	-
Tannin	+	+	+



Terpenoids	-	-	-
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Table 1. represents the primary phytochemical screening of aqueous water, methanolic and ethanolic extract of grape seed showed the presence of alkaloids, carbohydrates, tannins, flavonoids, proteins, terpenoids, anthraquinones and phenols. Whereas, cardiac glycoside, saponins, amino acids steroids were absent. In plants from predators and regulate their particularly well known as anesthetics, cardioprotective and anti-inflammatory agents. Flavonoids, phenols, quinones and tannins are possessing a number of medical benefits, including anticancer, antioxidant, anti-inflammatory, anti-aging and reducing oxidative stress.



From the Figure 1, is noted that the quantitative phytochemical analysis of various solvent extractions like Aqueous, Methanol and Eathanol extractions. The above values are obtained from the range of crude fibre, protein, are present in 39.7, 39.9 and 38 percent m/m, 7.4, 7.9 and 7.6. The above figure also reported on the presence of sterols in the values are obtained from the 7.6, 8 and 7.8 % (m/m) in the different solvent likes aqueous, methanol and ethanol. Total cholesterol present in the extraction of aqueous, methanol and ethanol in the ranges of 70.5, 71.5 and 71 % (m/m) respectively.

CONCLUSION

The bioactivities of their polyphenols are regarded to be the primary cause of the health advantages of grape seed ingestion. Multiple meta-analyses have suggested that dietary



polyphenols may have positive health effects on the most common chronic non-communicable diseases. Therefore, further research is needed to identify the specific polyphenol components in grape seed that show health-promoting effects. This is due to the fact that a cause-and-effect relationship between consuming grape seeds and their health consequences can only be established if their chemical make-up has been accurately described and standardized. Further research is needed to evaluate the effectiveness of grape seed extract in the food ecosystem and to establish their role as an antimicrobial agent in food safety.

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